A

Synopsis

On

Assessment of Ground water quality at Basmath, Dist. Hingoli, Maharashtra

Submitted

to

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of

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Introduction:

Water is one of the natural resources which is intertwined in the everyday life of human beings in myriad ways (drinking, washing, bathing, cleaning, cooking, irrigation, and other industrial and domestic uses). It acts as a driver of health, food security, quality of life and as a pillar for economic development. 97% of the water on our globe is saltwater, and only 3% of it is freshwater. The majority of the freshwater on Earth is trapped below in aquifers and glaciers. Only 1% of the water on Earth is readily available freshwater. The available fresh water sources are under immense pressure due to rise in demand owing to population growth, urbanization, industrialization and allied activities. further the quality of these water resources is depleting due to pollution from the sources such as industrial and domestic effeluent discharge, agricultural runoff and so on.. As per the World Health Organization (WHO), approximately 2 billion people around the world do not have safely managed drinking water services [1].

Groundwater quality refers to the chemical, physical, and biological characteristics of water that is stored underground in aquifers. It plays a crucial role in providing drinking water for a significant portion of the global population and supports various industrial, agricultural, and environmental activities. The quality of groundwater can be impacted by a range of natural processes and human activities, often resulting in either improvements or degradation.

Natural factors that affect groundwater quality include geological formations, mineral dissolution, and microbial interactions. However, human activities such as agriculture, industrial processes, urbanization, and improper waste disposal can introduce pollutants into the groundwater system. Common contaminants include heavy metals, nitrates, pesticides, volatile organic compounds, and bacteria.

Water found in rivers, lakes, streams, and wetland is known as surface water. Water that percolates into the ground is called ground water, which contain about 0.31% of the total water on earth. [2] Adequate drinking water quality is essential for the wellbeing of all humans who are depended on only water for drinking and domestic needs also in industry, agriculture etc [3-8].

Groundwater is one of earth's most vital renewable and widely distributed resources as well as an important source of water supply throughout the world. The quality of water is a vital

concern for mankind since it is directly linked with human welfare. In India, most of the population is dependent on groundwater as the only source of drinking water supply. [9]

Natural factors that affect groundwater quality include geological formations, mineral dissolution, and microbial interactions. However, human activities such as agriculture, industrial processes, urbanization, and improper waste disposal can introduce pollutants into the groundwater system. Common contaminants include heavy metals, nitrates, pesticides, volatile organic compounds, and bacteria. Keeping in the view of rapid Urbanization, heavy agricultural practices and sugar industry in this region present study has been undertaken.

Literature Review

T. Ramkumar, S. Venkatramanan, I. Anitha Mary, M. Tamilselvi and G. Ramesh found the ground water moderately suitable for irrigation at vedaranyam town inTamilnadu state [10]. Groundwater is important in the rural areas of the basin both for irrigation and domestic supply. Groundwater is derived from varying depths but mostly from a shallow (less than 80 ft) aquifers and a deeper aquifer (100-400ft). Concentration of as are highest in the low-lying part of the basin where condition is most reducing and groundwater flow is most sluggish.

Iron content in groundwater is also high. [11] In general ground water quality of Angul-Talcher region is not harmful to human beings. Except few instances where some parameters such as COD at Blinda, Danara and Takua Village, well water and turbidity at Blinda Village, well water were crossed prescribed limits of drinking water (IS: 10500).[12] The excess fluoride concentration in the study area may be attributed to the geological formation of that particular area and rapid ground water depletion.[13] Fluoride in basaltic aquifers was found in the range of.1 to 1.17 mg/l and in granitic aquifers, the range was.3 to 1.1 mg/l. The basaltic & granitic aquifer shows that the values are within the permissible limit. The Fluoride values are high in basaltic as compared with granitic aquifers. [14]

A comparative study of ground water i.e. bore well and hand pump water carried out by taking certain important parameters like pH, TSS, TDS, TS, TA, COD, Nitrate, Cl- , PO4 - , F- etc. In this present investigation it was found that the maximum parameters were not at the level of pollution except few parameters like nitrate, TDS, TSS, TS and TH in ground water. [15] Based on the analysis, most of the area at many locations near the solid waste dumping site falls in moderately polluted to severely polluted category indicating that the water is unsuitable for drinking purpose. [16]

Study area

Basmath is a city and a municipal council in Hingoli district in the state of Maharashtra, India. Basmath. Basmat, Vasumatinagari. city. Country, India.It is situated at Latitude: 19.3287 Longitude: 77.1575. The region is formed of Basalt anaphanitic (fine-grained) extrusive igneous rock formed from the rapid cooling of low-viscosity lava rich in magnesium and iron (mafic lava).

The river Asna is only one source of surface water but the avaialability of water is seasonal only in monsoon. So the population is dependent on the ground water for drinking, Domestic, Agriculture and Industrial purpose. The average population of Basmath city is 150000. The average depth of Bore wells are 250 to 300 feet. Major industry is PurnaSahakari sugar factory Basmath.

Basmat

Basmath

Aims and Objectives: -

- To assess current groundwater condition.
- To assess the suitability of groundwater for drinking.
- To investigate the effect of urbanization on ground water.
- To study the scope for irrigation and other significant uses.

- To generate baseline data of water quality for management strategies.

Methodology

The water samples were collected from open and boreholes in the study area.Appropriate amount of water sampleswill be collected polythene bottles from various wells every month covering (Postmonsoon, Summer, Premonsoon). Initially random sampling will be done as per the results final twenty-four (variable as per the condition) sampling sites will be fixed.Analysis variousphysico-chemical and biological parameters will be done as per the standard methods of CPCB, [17], Handbook of Methods in EnvironmentalStudies,

Sr.No	Parameter	Methodology adopted
01	pH	pH meter
02	EC	Conductivity meter
03	TS	Evaporation
04	Total hardness	Volumetric
05	Sodium	Flame photometric
06	Potassium	Flame photometric
07	Fluoride	Spands/Fluoride meter
08	Turbidity	Turbidimeter
09	Nitrate	Spectrophotomertric
10	phosphate	Spectrophotomertric
11	Iron and Chromium	Spectrophotometric/ Atomic Absorption Spectrophotometry

Significance of study:

Groundwater is almost globally important for human consumption, and changes in quality can have serious consequences. It is also important for the support of habitat and for maintaining the quality of base flow to rivers. The chemical composition of groundwater is a measure of its suitability as a source of water for human and animal consumption, irrigation, and for industrial and other purposes. It also influences ecosystem health and function, so that it is important to detect change and early warnings of change both in natural systems and resulting from pollution.

As in the study area there is Sugar factory, it has got a huge amount of effluent which affects the all physical chemical and biological parameters including heavy metals. The area is mostly dependent on the ground water for portability and if it's contaminated by the heavy metals it will affect directly or indirectly to the health of the peoples there that's why it is necessary to investigate the water quality in this area.

WORK PLAN

FIELD STUDY	GROUND WATER QUALITY
START OF PH.D WORK	AFTER COMPLETION OF REGISTRATION PROCEDURE
STUDY TERM (STANDARD)	THREE YEARS
FORM OF STUDIES	FULL TIME

STRUCTURE OF RESEARCH WORK

TIME(MONTHS)	**WORK**
00-06	RIVIEW OF LITRATURE AND PREPARATION FOR EXPERIMENTAL WORK ETC
06-30	PROBING OF WATER SAMPLES AND RELATED WORK
30-36	DATA COLLECTION/STATISTICAL INTERPRETATION,

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